



Home Theater
SPECIAL REPORT

**CUTTING THROUGH
THE CABLE HYPE**

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Cable Challenged? Not Anymore!

I've been asked to write the *Special Report* and make it available to my subscribers since many of you are cable "challenged"... time to change that.

There are a number of different ways for you to hook up all those fancy boxes that convert your DVDs and satellite signals into the video and audio that we love... we do that by using home theater cables.

In building my 11 seat home theater in my basement, I did quite a bit of research into the different kinds of cables that can be used in a setup. I've learned that there is a quality hierarchy that lists the different formats.

Cable information is spread all over the Internet, and if you've got a week or so, you can go searching for yourself. There is one thing that you should know before you start your research... the Internet has become a place of garbage.

Gone are the days that let you search freely for good information, from people that actually knew what they were talking about. Right now, searches produce a number of sites that are designed to sell you cables, and unfortunately the information you're going to get from these sites are biased towards the products that they are selling.

That's where this special report comes in handy. I've spent a lot of time researching cables over the past 10 years, and now I'm going to spend a lot of time trying to write this report in a clear, concise way... so you're not in the dark anymore.

Boy, Times Sure Have Changed

There once was a simpler time when all you did to get good television was to take that black cable that came out of the wall and hooked it up to your TV. We never really cared about what that black cable was attached to, but we all knew that it was attached to some sort of antenna on the roof. Turn the dial on the black box that sat next to the TV so you could get the best reception, and voila! You were watching TV.

Remember the audio? How simpler could it have gotten? Dolby digital and DTS weren't born yet. No speaker wires to hide, no speakers to position correctly throughout the room... we were just glad to hear anything out of that 6 inch speaker hidden inside the TV.

Times sure have changed... now you have to make sure your HDTV is 1080p, your satellite dish is pointed in the right direction, and check to see if you're on Video1 or Video2.

How does one make sense of it all?

With the explosion of the HDTV market, the cost to own one of these babies has dropped considerably. The manufacturers became smart and started bundling these HDTVs with the "theater in a box" which basically gave you all the parts to build your own home theater.

Of course, when you buy a "home theater in a box", the cables that you get are "for the masses", which basically means someone at the factory sat down one day and came up with the average cable lengths needed to satisfy the majority of customers.

So, that 3 foot HDMI cable that came with your system will probably be long enough for the majority of their customers, but not for everyone... what if you wanted to install your components further away from your HDTV than the 3 ft cable would allow? What if you just hung your plasma on the wall and wanted to put your components tucked away in the corner of the room?

That 3 foot HDMI cable is just not going to do it.

So this is a good starting place. Let's supposed you have to go above and beyond what you thought you might have to do... you need to buy new cables, but don't have a clue what they're called or what they're for...

Let's cut through that CABLE hype and get you what you need...

Cutting Through The Cable Hype

Okay, you need to realize something before we start:

Cable: A strand of steel wire, or copper wire, usually covered with some protecting or insulating substance

So in other words, a cable is basically a covered wire that is used to transfer some sort of information from one end to the other... in our home theater world, that information will be audio and video information.

That's it... just a wire.

Walk into an electronics store these days and you will be swamped with cables that the salesperson will claim are "The Holy Grail" of home theater connectivity. They'll show you cables that they say will "revolutionize" your home theater.

Don't get sucked into the hype.

Sure, you still need to pay attention to the limitations and lengths of the cable that could cause you problems with your particular setup, but don't throw yourself into a cable buying frenzy because the salesperson got you all worked up.

Truth be told, the standard quality cable will transfer information adequately for 95% of people with standard setups. The other 5% are one of the following:

- 1) The person building the \$100,000 theater in their mansion
- 2) The person caught in "upgrade hell"
- 3) The person with cable envy
- 4) The audiophiles and "hard core" video guys

I have never been in 1) or 4)... but I have been in 2)... number 3) is something I don't think I want to talk about here, I mean, I hardly know you. (wink wink, nudge nudge).

There are those out there that buy the top notch cables because they believe it is going to make a difference in their home theater experience, but based on my research, they are wasting their money.

Can you really hear the difference between speaker cable that costs \$1 per foot and the speaker cable that costs \$20 per foot? If you think you can, check your speakers because the \$1 per foot cable most likely covers the speaker's frequency range. That's right... the speaker now becomes the issue, not the cable.

The \$20 per foot cable may be able to send the speaker a wider range of frequencies, but the speaker can't do anything with it... so be careful.

There's one thing I can do for you to help you cut through the hype. I can supply you with information that will help you make the proper decision.

Based on the email I get, I've taken 8 cables that are most common in home theaters, and based on my research, have dedicated a full page to describe each one.

I have broken each cable description into 3 parts. The first part contains a picture of the cable/connection, the second part is a quick summary, and the third is more detailed information that I believe is important for you to know.

One more thing...

I've put information in these pages as a guideline based on standard cables... there could be variations based on what you might have in your setup. So, if I state that the maximum length of a certain cable is 40 feet, don't email me to tell me that you've got one that is 60 feet and it works just fine. Yes, I know... these are just guidelines.

Coaxial Cable



RF coaxial cable



Digital coaxial cable

Name: RF Coaxial cable and Digital Coaxial cable

Color: RF Coaxial cable – usually black, can also come in white
Digital Coaxial cable – usually black, can also come in white

Uses: RF Coaxial cable – transfers audio AND video
Digital Coaxial cable – transfers audio ONLY

Connector: RF Coaxial cable – thin “needle” surrounded by a threaded ring (“F” jack)
Digital Coaxial cable – RCA type

Max Length (standard cable: RF): approx 1600ft
(standard cable: Digital): approx 33ft

Ahhhh... our old friend coaxial... I think everyone has had experience with this guy. The basic coaxial cables are used to transfer television signals (audio and video) from an antennae, cable box, satellite dish or VCR.

Coaxial is just a thick wire... it's basically a thin wire covered by multiple layers of rubber, insulation and covered by a tough plastic. Since the inner wire is insulated by all these layers, there is little interference from outside signals.

Now, you may not know this, but there is a “new and improved” type of coaxial cable out there... it is called “Digital Coaxial Cable”

Digital Coaxial cable has only one purpose... to transfer digital audio. This, of course, is different than the regular coaxial cable that transfers both audio and video. What we're doing here with digital coaxial is dedicating the entire wire's bandwidth to the transfer of audio. This increases the quality of your home theater audio to a higher level.

You'll notice one more difference between the digital and regular coaxial cables... the connectors. The regular coaxial has a connector that looks like a needle, whereas the digital is an RCA connector (a thicker rounder end).

RCA (Composite) Cables



RCA cables



RCA connection



Adapter to join 2 cables

Name: RCA cables, or
Analogue audio & video cables, or
Composite audio & video cables

Color: Yellow connector – transfers video
Red connector – transfers right channel audio
White connector – transfers left channel audio

Uses: Transfers analog video and audio

Connector: Standard RCA type

Max Length (standard cable): approx 40ft

The cables are named “RCA” cables because they were introduced by the “Radio Corporation of America” to allow the connection between their phonographs to amplifiers.

These cables are quite common... you usually get these in the box with your component. Each cable represents a different signal... yellow is video, red is right audio and white is left audio.

Although these cable are quite common, there is one distinct disadvantage to using these cables: one cable for each signal. For example, a VCR can have 3 RCA cables going in, and 3 RCA cables coming out. By adding more and more components to your setup using these cables will create a “cable salad”.

Another disadvantage comes with interference... most of these cables do not contain a layer of insulation that would stop outside signals, and are therefore “unshielded”. They can become easily unbalanced due to outside signals creeping in, and audio/video become compromised. For the most part, they work just fine for the simple setup.

S-Video Cable



S-Video cable



S-Video connection



Adapter to join 2 cables

Name: S-Video cable (Separated Video), or Y/C cable

Color: Usually black

Uses: Transfers analog video

Connector: 4 pin (used for TV video)
7 pin (used for laptops and video cards)
9 pin (used for video cards with VIVO compatibility)

Max Length (standard cable): approx 150ft

The S-Video is another common cable that you'll find in the box accompanying your new component. It can be used instead of the yellow cable of the RCA style, and it contains 4 pins to transfer video.

The S-Video cable separates the video signal into 2 parts: brightness and color. Those signals are then combined back into a picture in the TV. Since the signals are separated along the cable, the picture is usually sharper than the regular RCA type.

Since there is a lack of bandwidth, the S-Video cable is not intended for HD video. From my research, the cable has a maximum of 480i or 576i resolution.

The main disadvantage to the S-Video cable is that the pins on the connector are usually weak and can bend easily, so be careful trying to plug it in. They can be straightened out (been there, done that), but it should be noted that they can break with little effort... if one pin breaks, you can go and buy a new cable.

Component Cables



Component cables



Component cable connection

Name: Component cable

Color: Green connector (luminance signal Y)
Blue connector (color difference B-Y)
Red connector (color difference R-Y)

Uses: Transfers analog video

Connector: Standard RCA type

Max Length (standard cable): approx 100ft

The component cable is one step higher than the S-Video cable when it comes to the transfer of an analog video signal. As in the S-Video cable where the video signal is split into 2 separate parts, the component cable splits the video signal into 3 separate parts.

The 3 separated video signals used in this configuration represent a higher quality than the single cable commonly used to hook up video equipment because the brightness and color components of the signal are maintained separately.

How the cable separates and transfers the signal is a little outside the scope of our talk here... it can get complicated considering there are quite a few conversion formulas that be used. I was never good at math.

DVI Cable



DVI cable



DVI connection

Name: DVI cable (Digital Visual Interface)

Color: Usually black, I've seen white/grey

Uses: Transfers digital video

Connector: There are 3 different connectors that can appear on the end of a DVI cable and each accommodates different variations of signal. There are up to 29 pins that can appear on the connector, and depending on the variation, the number of pins changes.

Max Length (standard cable): approx 16ft

Okay, now we move to digital cables. This DVI cable was created to maximize the video quality of flat panel LCD monitors and modern video cards. It quickly moved to become the standard not only for LCD and computer displays, but for all types of HD... plasmas and high end displays.

There are 3 different formats for DVI:

- DVI-D (true digital video)

- DVI-A (high res analog)

- DVI-I (both true digital and hi res analog)

Knowing which one you need requires you to understand what connectors that you have on the back of your HDTV and component. The correct DVI cable usually comes with your component... whether it matches your TV is a different story.

If you're having trouble figuring this one out (it takes practice), try to move to an HDMI cable.

It should be noted that the DVI cable doesn't carry audio... just digital video.

HDMI Cable



HDMI cable



HDMI connection

Name: HDMI cable (High-Definition Multimedia Interface)

Color: Black, white, grey

Uses: Transfers HD video and 8 channels of digital audio

Connector: 19 pin HDMI type, silver or gold plated

Max Length (standard cable): approx 50ft

This cable is the workhorse of HD. It can transfer 1080i/p resolution and a complete 8 channels of digital audio. This is the cable you want to use if you have the connections on your HDTV and components.

This is the current king of all HD cables... not only in transfer ability, but also in price. These cables can be expensive depending on length and quality, so do your research... there are some good deals on the Internet.

The HDMI cable is made from twisted pairs of thin copper and this can cause problems with long runs. With longer runs, the signal tends to deteriorate from end to end, and this can be seen by distortion, sparklies, or no picture at all... you'll only get the audio.

Optical Cable



Digital optical cable



Optical connection

Name: Digital Optical cable, or Toslink cable

Color: Black, white, grey

Uses: Transfers digital audio

Connector: Fiber-optic

Max Length (standard cable): approx 33ft

This cable may look like there's a wire inside, but in fact it is a coated strand of flexible plastic or glass. If you look at the end of this cable (NOT WHEN IT IS PLUGGED IN), you'll notice a transparent tip. What you've got here is a real fiber-optical cable.

Toshiba created this cable in 1983 to connect their CD players to their receivers and it quickly became adopted by manufacturers to connect all CD players. It became apparent that one of the benefits to this optical cable was that it wasn't susceptible to outside line interference that other "wire based" cables experienced.

The cable transfers the digital audio signal along the strand of flexible plastic or glass, on a beam of light. The cable uses a series of on/off pulses of light when transmitting... it does not utilize a laser, but rather an inexpensive LED.

The average consumer can use the standard digital optical cable for their setup, but for those of you feel you need a higher end optical cable to separate "mediocrity from excellence", there are 3 factors to consider when purchasing one:

- 1) Quality of the inner strand of flexible glass
- 2) Clarity of the optical connection (tip ends)
- 3) Flexibility without signal loss

Speaker Cable



Speaker cable



Speaker connection

Name: Speaker wire, In-wall speaker cable, Zip cord cable

Color: Transparent, bronze, white, black... whichever you prefer

Uses: Transfers audio to speakers

Connector: Bare ends, banana clips, spade lugs, etc

Max Length (standard cable): depends on gauge (thickness)

Ah yes... the speaker cable... the lifeblood of any home theater (unless you've gone wireless). Of all the emails I get from my readers, questions about speaker wire rank in the top 3.

Speaker cable consists of two identical wires insulated by a coat of plastic. Even though the two wires are the same, one is always marked (with a color, or a thread, etc) so it is easy to setup correct polarization.

I would talk more about speaker wire, but I'm saving my discussion for my website...

<http://www.myhometheatersecrets.com>

SUMMARY OF CABLES DISCUSSED

Cable*	Transfer		Format		Connector	Max Length (approx)
	Video	Audio	Analog	Digital		
RF Coaxial	✓	✓	✓		“F” jack	≅ 1600 ft
Digital Coaxial		✓		✓	RCA	≅ 33 ft
RCA (composite)	✓	✓	✓		RCA	≅ 40 ft
S-Video	✓		✓		4 pin	≅ 150 ft
Component	✓		✓		RCA	≅ 100 ft
DVI	✓			✓	29 pin	≅ 16 ft
HDMI	✓	✓		✓	19 pin	≅ 50 ft
Optical (Toslink)		✓		✓	Fiber-Optic	≅ 33 ft
Speaker cable		✓			Bare ends**	Depends***

* These are standard cables of common width and length

** There is an assortment of different connectors to speaker wire

*** Maximum length depends on gauge (thickness) of wire

FINAL THOUGHTS

This special report was written to detail all the different cables that are used to make home movie magic. Once you know and understand what the different cables do, you will be able to use them to your advantage.

There is an order of “good to best” when it comes to cables and I think it’s only fair that I share it with you...

The Hierarchy of Cables

RF coaxial
RCA cables (Composite cables)
S-Video
Component
DVI / HDMI

Now, if you’ve been paying attention, the list above is exactly the order I used to describe the cables in this special report. The optical cable and speaker cable descriptions are not in the above list because they deal with audio... the above list is mainly for video.

One thing I’d like to also touch on is a brand of cable that is popular. It’s called Monster cable and it is rather expensive. Some people only buy Monster cable, and others don’t bother since it is not in their price range.

There is a HUGE debate whether these Monster cables are better than the standard cables... you get a different answer depending on who you talk to. There is this perception that the more you pay for a cable, the better it is.

Are they any better? Beats me... I’m getting older, and quite frankly, my senses aren’t as good as they used to be. So if these cables are better, I wouldn’t be able to hear/see the subtle differences that these cable can produce... but remember, if you get expensive cables, then you better not be hooking them up to mediocre equipment.

Enjoy your home theater,



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